

aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa

STEARNS, H. P.

The discovery of modern anaesthesia:
a critique. Hartford, 1876.

aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa



H. P. S.

THE DISCOVERY OF MODERN ANÆSTHESIA:

A CRITIQUE.

BY H. P. STEARNS, A. M., M.D.,

SUPERINTENDENT OF THE RETREAT FOR THE
INSANE, HARTFORD, CONN.

REPRINTED FROM THE PAGES OF THE *MEDICAL RECORD*.



HARTFORD:
PRESS OF THE CASE, LOCKWOOD & BRAINARD COMPANY.
1876.

ДАЖДИ СВОЛТАН
ЧАЛАЯНУ ЧГЭРДОВ

THE DISCOVERY OF
MODERN ANÆSTHESIA :
A CRITIQUE.

BY H. P. STEARNS, A. M., M.D.,

SUPERINTENDENT OF THE RETREAT FOR THE
INSANE, HARTFORD, CONN.

REPRINTED FROM THE PAGES OF THE *MEDICAL RECORD*.

HARTFORD :
PRESS OF THE CASE, LOCKWOOD & BRAINARD COMPANY.
1876.

THE DISCOVERY OF MODERN ANÆSTHESIA:— A CRITIQUE.*

By H. P. STEARNS, M. D., HARTFORD, CONN.

COLUMBUS conceived the idea, or received it from the records of voyages made by mariners before his time, that one, by sailing due west, would discover land. He accordingly acting upon this suggestion, left Spain on the 3d of August, 1492, and on the 12th October discovered one of the Bahama Islands.

He afterwards made three voyages, discovering several islands and the mainland of the new continent, though not himself aware of the fact. Through the machinations of his enemies, he was sent home from the field of his discoveries in chains; and finally, after suffering disgrace and the ingratitude of his king during seven weary years, he died in poverty and neglect, not even knowing, himself, that he had added a continent to the wealth of the world! During the latter part of his life, and for years after his death, others claimed the honor of his discoveries, and sought to reap the emoluments arising from them.

Jenner when a student in medicine heard from a young woman that she could not take small-pox, because she had already had cow-pox. This suggestion he never forgot; but not until 1796 did he actually make the test, and demonstrate it to be a fact by vaccinating James Phipps. He immediately wrote to his friend Gardner that he had at length accomplished what he had so long been waiting for, and with exultation declared that the boy had since been vaccinated for small-pox without success, as he had

* To avoid references to authorities in the several portions of this paper where they might seem to be required, I will here remark, once for all, that every essential statement made, has been substantiated by the sworn testimony of disinterested persons holding the highest social positions in Hartford, as well as of physicians, clergymen, and lawyers—such evidence as would be deemed sufficient to vindicate claims in any of the courts of justice in this or other countries.

ventured to predict. After making other experiments (unfortunately we do not know how many) he went to London to make known, more widely than before, his discovery. His reception was disheartening in the extreme. Not only did the doctors refuse to make trial of the process, but the discoverer was accused of an attempt to "bestialize" his species by introducing into their systems diseased matter from a cow's udder. He returned home, with surprise and chagrin, and afterwards published an account of seven (7) successful cases.

But it was not until about a year afterwards that his discovery began to be looked upon with any favor, and then it was brought about by one Mr. Cline, who had been successful in vaccinating some persons. Some of his medical brethren undertook to rob him of the honors of his discovery, and it was not until some three or four years after his first experiment that vaccination with vaccine from cows came to be accepted by the profession, and he honored as its discoverer.

Wells, on the 10th December, 1844, witnessed some experiments made with nitrous oxide, and saw one person while under its influence bruise himself severely. After the effects of the gas had passed away, he questioned this person as to his injuries, and learned to his surprise that he was unaware of any. He then made the suggestion to David Clarke that one could have a tooth extracted without pain while under the influence of that gas. The next day he took the gas, and had a molar tooth extracted without pain by his friend Riggs. During the next few weeks he tried the experiment upon fifteen (15) persons, extracting teeth in all cases without pain except two. These thought they felt a little pain. Elated with his grand discovery, he started for Boston to make it known more widely than could be done in Hartford. He at once went to his former pupil Dr. Morton, and to one or two surgeons, all of whom received his statements with much incredulity. After waiting several days, he succeeded in getting an opportunity to test his theory once in the extraction of a tooth; but as the bag containing the gas was removed too soon, the patient made some noise and shouted, and in consequence the audience of medical students hooted and hissed and called the whole affair "*a humbug.*"

Wells returned home annoyed and disappointed, and being of a sensitive nature, and in delicate health, was quite unwell for several months. He however continued to use the gas in his own

office, when engaged in dentistry, or with his friend Riggs ; and during the succeeding two years, in as many as fifty (50) cases successfully. One of the surgeons of the city, Dr. Marcy, after a conference with Wells in relation to the properties of sulphuric ether as compared with those of gas, used ether and removed an encysted tumor without pain while Wells was present. He encountered great obstacles in vindicating his claim as discoverer, because his former pupil, Dr. Morton, laid claim to the honor of discovery in consequence of having succeeded with ether in 1846. Wells, having exhausted his slender resources, and stung by the treachery and ingratitude of one to whom he had revealed the steps to his discovery both in respect of gas and ether, after nearly two years of effort to vindicate his claim became insane and died.

The above three cases rest upon precisely the same kind of evidence, and have points of remarkable similarity. Each of the parties had a definite idea in his mind and announced it to others. The first, that by sailing due west from the southern portion of the European Continent, one would discover land. The second, that the system was so constituted that it would become insensible to the poison of small-pox, by first becoming vaccinated with cow-pox. The third, that the system was so constituted, that by inhaling enough nitrous oxide gas, it would become insensible to the pain of surgical operations.

Each of them succeeded in demonstrating that his idea was a truth, before any other person laid claim to having done so. Two of these parties found great difficulty in convincing the medical profession that they had made a discovery of incalculable value to the world. They all had rival claimants to the honor of discovery, and years passed before the completeness and full significance of their discoveries were understood.

There no longer exists any doubt as to whom the honor of discovery belongs in the first two cases ; and the third is so similar, in all the essential points pertaining to a discovery, that a mere statement of the case, in conjunction with the others, would seem to be enough to place it beyond dispute.

And, since the American Medical Association, and other learned bodies and men, both in this and other countries, have pronounced in favor of Wells as the rightful discoverer of modern anæsthesia, his friends might well rest content, and let posterity do as it has done in the other cases, award to each his rightful niche in the gallery of discoverers.

But the friends of one of the claimants, with a pertinacity as great as that shown by the Court of Spain in its efforts to detract from the honor of Columbus, still persist in keeping his case before the public, and in endeavoring to secure honors and emoluments which rightfully belong to another. In fact, our Boston friends, with a pardonable pride in matters of *scientific discovery*, not unfrequently formulate their convictions thus:—

‘W. has shown this, and J. that ; but it was reserved for our own M. to make the imperishable discovery. And it seems probable that the average Bostonian still believes that modern Anæsthesia was first discovered by inhaling ether.’

Therefore it is a matter for special congratulation on the part of the friends of Wells, that this latest effort on behalf of Morton has been presented by no less a person than Professor Henry J. Bigelow, M. D., of Harvard University.* This is specially gratifying because we may be sure that one who has from the first been deeply interested in, and identified with the ether claim, and has done far more for it than Morton himself, will be sure to present the case with learning as well as every available argument in its favor. If therefore a critical examination of Dr. Bigelow’s arguments shall eventuate in showing that they are unsound ; that in fact they are wide of the subject he undertakes to discuss, pertaining to improvements since rather than to the subject of discovery ; and that Morton obtained his knowledge of anæsthesia from Wells, in the first instance instead of by discovery, and that his work was a mere continuation of what Wells had already shown, and to be ranked with the labors of Sympson, Richardson, and others—I think we may let the case rest.

Let us therefore examine the views of Dr. Bigelow in reference to Wells’ claim, in the light of history, as shown in the two cases already presented. And that there may be no misunderstanding in the use of terms, it may be well to define two or three as preliminary.†

1st. A discovery is “the finding out or bringing to light something before unknown.”

2d. “*An Anæsthetic* is an agent which produces anæsthesia by being received into the lungs in the form of vapor or gas, and

* Dr. Bigelow’s paper appeared in the January number of “The Journal of the Medical Sciences,” with the title of “The Discovery of Modern Anæsthesia.”

† This really becomes necessary, as there seems to be so much confusion in the mind of Dr. Bigelow with reference to the ordinary signification of terms.

passing with the blood to the nervous centres on which the action is exerted."

Examples: chloroform; sulph. ether; nitrous oxide; chloric ether.

Using these definitions, we find the discovery of modern anæsthesia to be the bringing to light or making known what was before unknown, viz., that the body can be rendered insensible to surgical pain by the inhalation of one of the above-named substances.

Did Wells conceive this idea and convert it into a certainty before Morton did? Dr. Bigelow admits his priority of inception but denies that he demonstrated its truth. He considers that thirteen (13) cases of painless extraction of teeth were insufficient for this purpose—that the partial failure in rendering two of his first fifteen cases insensible vitiated his proof and rendered it inconclusive. Let us look a little more closely into this view of the subject. What did these two partial failures render inconclusive? Was it that the body could be rendered insensible to pain by breathing nitrous oxide? Certainly not! That must in the nature of things have been a fact since man and nitrous oxide have existed. Neither Wells nor any one else created this fact. It is a fact now; it was a fact then; it has been such in all ages; and Wells when he brought to light this fact on the 11th Dec. 1844 thereby became a discoverer. We now know and he suspected why he partially failed in those two cases. A few more inspirations of gas would have rendered them just as perfect as his other cases, and I fail to see how this circumstance affected in any way the essential fact.

Let us see how Jenner would have fared in Dr. Bigelow's view. When he had made but *one* successful vaccination he proclaimed to his friends that he had demonstrated his prediction, and the date of that first successful vaccination has been celebrated ever since as the time of his discovery. Was it made then or afterwards? If afterwards, when? Was it with his second, or fifth, or seventh case? Jenner evidently thought it was with his first.

If then, Jenner's discovery is universally conceded to have been when his first case proved successful, why not Wells' also? Wells no more needed fifteen or one hundred and fifty cases to make his a discovery than Jenner.

Again, take the case of Columbus. When do we date the discovery of a new continent by him? Why on the day that he first

described that little island. The continent was not discovered except prospectively for years afterwards or until his third voyage. This developed or grew out of the island discovery. Was it therefore any the less discovered? Or if Columbus had died previous to his third voyage would he any the less have been entitled to the honor of having discovered a new continent?

Let us now refer to the question of "*certainty*." Dr. Bigelow lays much stress upon the seeming failure of Wells in his experiment before the Medical Class in the Massachusetts Hospital. Does this failure (if it was one, which is by no means certain) in any way invalidate Wells' claims? I think not. The anæsthesia had been perfect in his former thirteen (13) cases. Dr. Bigelow admits that insensibility by nitrous oxide at the present time is "*unfailing*." Does a failure to secure it on one occasion affect the question at all? Would it do so now? If not now, why then?

Suppose Columbus had perished in his second voyage on account of the unseaworthiness of his vessels, or for any other reason had failed to reach the islands he had discovered during his first voyage, would this failure have in any way affected the fact of his discovery during his former voyage?

Or let us suppose that the first case in which ether was given in the Massachusetts Hospital, had been one, such as we are all familiar enough with now—a person of full plethoric habit and accustomed to the free use of stimulants, and in consequence that after ether had been given a few minutes he had begun to shout and struggle, that his face had become livid, his eyes partially fixed, and he had exhibited symptoms of becoming asphyxiated. Let us suppose Morton to have been a stranger with only one or two friends who really knew nothing about the effects of ether, or if anything only enough to make them doubt as to its safety—that the audience was one of students, attracted by curiosity; under such circumstances, which we all know might have occurred, can we doubt there would have been shouts of derision, and if the operator had continued of denunciation and interference long before etherization had become complete? Yet it would simply have been a repetition of Wells' experiment, or rather worse, and signified nothing in reality as to the merits of the case.

Again, Dr. Bigelow says that Wells failed because he did not show that anæsthesia by nitrous oxide was "*inevitable*." In another place, he admits that anæsthesia by nitrous oxide is now in-

evitable. If so now, why not then? Do facts in nature change? Hear his explanation—"We now give a much larger dose!" Does he know how much Wells gave? We know he gave enough to produce anaesthesia in thirteen cases. He knew no reason why he should not do so in all cases. If through inadvertence or mistake he, or any one else, gave too little twice or thrice does it affect the fact of discovery? Would it have affected Jenner's discovery if vaccinations had failed in three or four of the first fifty cases through neglect to use fresh matter or through its imperfect introduction? How often do we now fail for this very reason. There has never been a time when such failures have not occurred. Vaccination is not now nor has ever been as *inevitable* as anaesthesia by nitrous oxide. Do we any the less honor Jenner as its discoverer?

Why then should Dr. Bigelow think that too small a dose in a few of the first cases of anaesthesia should render Wells' claim void? If now, after thirty years of experience we found that only nine (9) out of ten (10) persons could be rendered insensible to pain by inhalation, anaesthesia would be still one of the most wonderful discoveries of the age and of inestimable value to mankind.

Again Dr. Bigelow says, Wells failed because he did not prove that anaesthesia by nitrous oxide was "*safe*." Is it safe now? If now, it was then. Wells never found it otherwise. Was anaesthesia by ether safe during the first month of its use? Neither Dr. Morton or Dr. Bigelow knew that it was safe in the first case or in the first fifty cases. In fact some time after it had been used in the hospital, Dr. Bigelow says Morton did not know in what the danger of using it consisted, but was on hand with a bag of oxygen. But, surely, we need not argue the question of *safety*, as we all must know that it has nothing whatever to do with the fact of discovery but is merely an incidental. I very well remember hearing, when a medical student, Dr. Bigelow, while discussing the question of the safety of anaesthesia, say that if it were certain one person out of a supposed number (I forget precisely the number now) who should be rendered insensible by etherization would die, still the discovery of anaesthesia would be one of inestimable value—that the risks should be taken as we take them in travel by railroads and steamships.

So much for Dr. Bigelow's three points which he considers essential to modern anaesthesia. They are all incidentals merely;

and, though important as indicating the value of the discovery, yet in the nature of the case could only become known long after both Wells and Morton made their claims.

It appears to have dawned on the mind of Morton after some years that his claim could not rest on the fact of discovery, and in another part of Dr. Bigelow's paper the line of argument is changed. He says, "But Morton also urged that this was not a discovery in science, but in art; that surgical anæsthesia was due, not to any scientific novelty in the long recognized ether insensibility, but to his having worked out the application of this insensibility to use in art, with enterprise, and perseverance, through many details, in the midst of dangers, till he gave to the world a perfected system of efficient and safe anæsthesia. Morton was right again."

Let us analyse this view a little. Not a discovery in science, but in art; *i. e.*, the *manner* of administering ether! Neither Morton nor Dr. Bigelow took this view, when his claim was made, nor until years afterwards. They at first claimed that he had discovered a *fact*, and one of the most wonderful and useful ever brought to light in science. But finding, later, that they could not vindicate this claim because Wells had proved his earlier discovery, they then try to make the *manner* of administering ether cover the whole ground.

If this view is correct, anæsthesia has been discovered every time any one has found an improved method of giving ether, or ascertained that it could be produced by chloroform, or chloric ether, or other anæsthetic. No one now gives ether in the same way in which Morton first gave it; the *modus operandi* has changed again and again. The great fact of modern anæsthesia lies back of any *manner* of producing it, and this it was which Wells discovered, when he demonstrated that the body could be rendered so insensible to pain that a nerve could be lacerated or torn and the person not know it. No person had ever done this before, or made any such claim. The argument as to *method*, if used by any one less eminent than Dr. Bigelow, would be deemed puerile by scientific men. We might as well say, that the discovery of America consisted in improving the art of navigation, because one could by this improvement, reach the continent more *certainly* and *safely*! or that the discoverer of a new planet is he who succeeds in so improving a telescope, or in making a better one, that a planet discovered two years before could be more easily or certainly found again!

Again. Does the working "out the application of this insensibility to use in art, with enterprise and perseverance, through many details, in the midst of dangers," rightly constitute Morton the discoverer of modern anæsthesia? I fail to see how it does.

The truth is, there has never been a great scientific truth discovered, concerning which there was not additional knowledge afterwards coming to light. Newton is supposed to have conceived the idea of the law of gravitation when he saw the apple fall while sitting under the tree, and afterwards demonstrated the existence of such a law or condition; but how little did he at first comprehend the whole system in all its details and extent.

The Brothers Pinzon, with wonderful perseverance, and in the midst of great dangers, succeeded in making many discoveries additional to those of Columbus; and either they, or somebody else, first showed that Columbus had discovered a continent, instead of the confines of Asia. In fact, they and others did immensely more towards developing and bringing to light, and thereby rendering the discoveries of Columbus valuable, than Morton has ever done in relation to Wells' discovery. All this has not changed the verdict of mankind, nor in any measure dimmed the honor of Columbus. Can it be possible that posterity will not render a like verdict for Wells?

Before proceeding further, I must refer to an effort by Dr. Bigelow in the first part of his paper to rank the results of Wells' labors with those of Sir Humphry Davy. He says: "In 1844 Horace Wells appeared, exactly repeating the hypothesis Davy had printed. Davy announced it, and the scientific world knew it. Did Horace Wells convert into a certainty the probability of Davy? He did not."

Let us examine this proposition a little. As preliminary, however, we will refer to a remark of Dr. Bigelow, in his preface to the extract containing Davy's suggestion. He says: "It is impossible to read the annexed statement without renewed amazement, that this great blessing to animal existence was distinctly offered to scientific men, and as distinctly rejected by them, for half a century. The great discovery was here clearly pointed out to every tyro in medicine and chemistry. It only remained for somebody to test this hypothesis, this guess, and to convert the guess into a certainty."

What "great blessing to animal existence" was so distinctly offered to scientific men by Davy? Was it an improved method

of administering ether? Not exactly! What was it? Why that "as nitrous oxide in its extensive operations appears capable of destroying physical pain, it may probably be used with advantage during surgical operations." This is the suggestion,—the guess. It has nothing whatever to do with *mode, safety, or completeness*. Yet Dr. Bigelow says it only remained for somebody to test this guess, and convert it into a certainty. He here seems to have a correct idea as to what constitutes modern anæsthesia. He is now, however, dealing with Davy. Is anæsthesia one thing with him when discussing Davy's suggestion, and another when discussing what Wells did? It has this appearance.

But it only remains to test this "guess." Pray how shall it be done? How is it likely Davy would have done it? If he had been a dentist, very likely he would have drawn a tooth. If he had been a surgeon, he might have opened an abscess or amputated a finger. Either of these would have been a test, and if there had been no pain, a very conclusive one; and he would very likely have said, as Jenner did after his first successful case of vaccination, that he had converted his prediction into a certainty. Do we think there would have remained any doubt in his mind if he had found the same result in a dozen cases? Would he not have been warranted in saying to the world, "I have tested my prediction, I have demonstrated its truth?" If he had done this, would Dr. Bigelow have questioned his conclusions, or denied him the honor of discovery to-day? His whole language indicates the contrary. Yet he says Wells did not apply the test to this guess. So far as I know, there is not the slightest reason for supposing that Wells had any knowledge of Davy's suggestion, or that he obtained it from any one. We have seen how he came to have it—and that, to test it, he lacerated the nerves of more than a dozen persons, and then went to Boston for the purpose of making known the results and using it in a case of amputation in the hospital. His failure in Boston was no greater than that of Jenner in London. He and his friends continued to use it till his death. And yet Dr. Bigelow says he left the knowledge of anæsthesia "just about where Davy left it half a century before." I do not believe a more unjust, harsh, and illiberal statement has been made in the discussion of any question of discovery or science during the last half century.

During the whole anæsthetic controversy great stress has been laid on the fact that Wells, after his disappointment in Boston, in

a measure left the practice of dentistry and engaged in other pursuits which furnished him a more active life. This has been magnified by Dr. Bigelow and others into a total abandonment of his discovery. His family and his professional friends have testified again and again that this was not true. Moreover, his widow now has the bags for holding the gas which she made for him in the year 1845, and she was making them from time to time because he wished to increase the doses in certain cases. His friend Riggs was using it during the same year, and now has the book containing the original entries of his charges. Dr. P. W. Ellsworth wrote to this effect a letter, which was published in the *Boston Medical and Surgical Journal* in 1845; so that the evidence is indisputable; and yet Dr. Bigelow, in this centennial article on the discovery of anæsthesia, is so partisan as to ignore this evidence and reiterate the old story.

Again, not only were Wells, Riggs, and others using nitrous oxide in Hartford during 1845, but Morton was thoroughly aware of the fact; and during that and the succeeding year came to Hartford on at least two occasions, and is known to have had conferences with Wells on the subject, and from him and Riggs learned the fact that ether as well as nitrous oxide had been used. This last interview was only a short time before he drew the tooth of Eben Frost, under the influence of ether, in Boston. Therefore, as the whole truth stands it is as clear as the light of noon-day that Morton's experiments were simply a continuation of Wells'. In fact, Dr. Bigelow himself, when discussing the claims of Jackson and Morton, says, "There can be no question that Morton knew about ether." Here we see how he came to know about it. He learned from Wells how he had produced anæsthesia with nitrous oxide and ether, as Mr. Cline learned from Jenner how to produce vaccination. The pupils in both cases were the instruments through whom the discoveries were to become more largely known; but what a contrast in their after-conduct!

The letters of Drs. Morton and Wells, dated respectively Oct. 19 and 20, 1846, are again brought forward by Dr. Bigelow to prove that Wells had given up anæsthesia by nitrous oxide as worthless. Yet this letter proves nothing of the kind, as we readily perceive, when we understand the impression under which it as was written. Morton, in his letter, misled Wells by a false statement. He claimed to have discovered a "compound" which was vastly superior to Wells' gas or ether. Wells, with the diffi-

culties attendant on manufacturing, keeping, and transporting gas, and the supposed danger of ether, thought Morton had hit upon something likely to obviate these difficulties, as was claimed ; and with the impression wrote this letter of congratulation to his quondam friend, as was natural. By doing so he had not the remotest thought of yielding his claim to the discovery of anæsthesia ; and after his visit to Morton in Boston, returned home not a little surprised at Morton's claim, having ascertained to his own satisfaction that the "*compound*," or "*letheon*," as Morton called it, was simply ether which he had already used, knowing the effects to be similar to those of nitrous oxide. We might as fairly expect Morton to have relinquished his claim, because the next year Simpson discovered the anæsthetic properties of chloroform, which does away so far with the disagreeable properties of ether, that it very nearly superseded the use of the latter everywhere outside of Boston for several years.

Did space permit I should like to refer to other portions of Dr. Bigelow's paper, but it seems hardly necessary to do so ; I must however again draw attention to the inconsistency appearing between the opening and closing of the article. The subject of his paper he announces as "*The Discovery of Modern Anæsthesia*." He closes with an all hail to "*The Inventor of the Art of Anæsthesia!*"

Surely the learned Professor cannot have forgotten, or expect others to forget, the distinction between a *discoverer* and an *inventor*—a *discovery* and an *invention*. His exclamation sounds very much as it would in speaking of the discoverer of America ; "All honor to the discoverer of the art of steam navigation !" Or of the discoverer of vaccination, "All honor to the discoverer of the art of *vaccinating with a quill, or a spring lancet!*"

In closing, I think we may fairly formulate what has been done in modern anæsthesia as follows :

1st. In December, 1844, Wells made the suggestion and applied the test in his own person by inhaling a large dose of nitrous oxide, and having a tooth extracted without pain. He and his friends in Hartford continued to perform painless operations with nitrous oxide (except once, when ether was used) until his death.

2d. In September, 1846, Morton, a former pupil of Wells, aware of his discovery and repeating his experiments, extracted a tooth without pain, while the patient was under the influence of sulphuric ether. He afterwards introduced the practice of anæsthesia by

ether into the Massachusetts Hospital, and from there it became known to the world.

3d. In 1847, Simpson first introduced the practice of anæsthesia in Midwifery, thereby making known more widely its value. He also discovered the anæsthetic properties of chloroform, and by his writings and teachings very largely contributed to introducing the practice of anæsthesia to the world.

4th. Others have since discovered the anaesthetic properties of different vapors, which are more or less used in practice.

The friends of Horace Wells have no desire to detract from the merits of what has actually been done by Morton, or Jackson, or others, in the field of anæsthesia ; nor, on the other hand, do they propose to have the great fact of its discovery and first introduction by him ignored or set aside without protest.



Accession no.

1294

Author

Stearns, H. P.

Discovery of
modern anaesthesia.

Call no.

PAMPHLET BINDER
PAT. NO.
877188

Manufactured by
GAYLORD BROS. Inc.
Syracuse, N. Y.
Stockton, Calif.

Accession no.

7294

Author

Stearns, H.P.

Discovery of

modern anesthesia

Call no.

ANESTHESIA

TTT 25

